



C5658

Detects optical signals at 1 GHz, with high sensitivity

The APD module C5658 is a highly sensitive photodetector consisting of a Si APD (avalanche photodiode), a bias power supply and a low-noise amplifier, all integrated into a compact case. The APD used has an effective photosensitive area of $\phi 0.5$ mm to allow efficient coupling to a light beam in applications such as FSO (free space optics). The APD internally multiplies the photocurrent to produce an ample gain (set to 100 times for the C5658) and also features high-speed response, achieving detection limits up to 1 GHz wideband and -48 dBm (16 nW rms) noise level in combination with the low-noise amplifier. The C5658 also incorporates a thermosensor and a temperature-compensated bias power supply necessary for stable operation of the APD. Highly sensitive optical measurements can be made just by supplying +12 V to the C5658.

Features

- High-speed response and high sensitivity
- Flat frequency characteristics
- Compact and lightweight
- Single power supply operation

Applications

- Laser radar
- FSO
- Optical rangefinder

Absolute maximum ratings

Parameter	Condition	Value	Unit
Supply voltage		+13.5	V
Maximum incident light level	Continuous input	10	mW
Operating temperature		0 to +50	°C
Storage temperature		-20 to +70	°C

Note: Exceeding the absolute maximum ratings even momentarily may cause a drop in product quality. Always be sure to use the product within the absolute maximum ratings.

Electrical and optical characteristics (Ta=25 °C, Vcc=12 V, output terminated with 50 Ω)

Parameter	Condition	Typ.	Unit
Spectral response range		400 to 1000	nm
Photosensitive area		$\phi 0.5$	mm
Quantum efficiency	$\lambda=800$ nm	70	%
Cutoff frequency (-3 dB)	High band	1	GHz
	Low band	50	kHz
Detection sensitivity	$\lambda=800$ nm	2.5×10^5	V/W
Gain stability	25 °C \pm 10 °C	± 5.0	%
Noise level	Dark state	-48	dBm
Output impedance		50	Ω
VSWR*		1.5	-
Compression point at 1 dB		3	μ W

* VSWR (voltage standing wave ratio)

If internal matching of elements on a signal transmission line (matching between element input/output impedance and signal line impedance) is poor, signal reflections occur that generate standing waves on the signal line. The VSWR is the ratio of standing wave maximum amplitude (V max.) to minimum amplitude (V min.) and indicates how well the impedance is internally matched. When this internal matching is complete, no standing waves exist and the VSWR is 0 (zero).

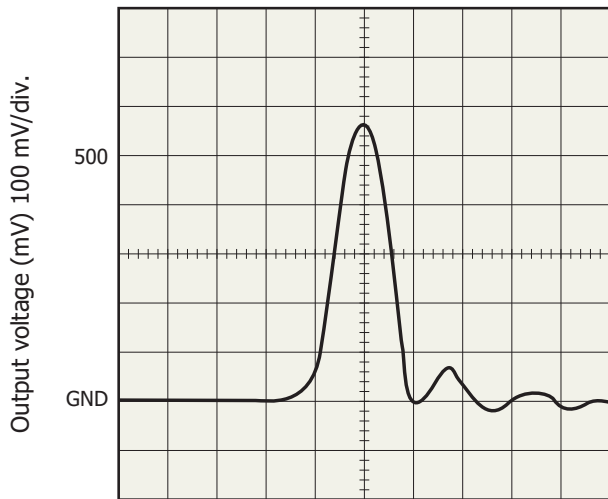
Signal connector

Parameter	Standard
Signal output	SMA
Power supply connector	D-sub 9-pin

Structure

Parameter	Condition	Value	Unit
Supply voltage		+12 ± 0.1	V
Current consumption		100	mA
Dimensions	Excluding projecting parts	28 × 50 × 60	mm
Weight		120	g

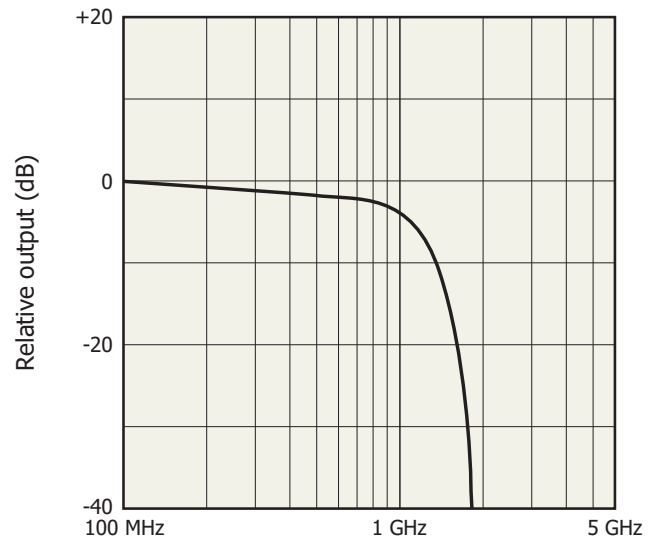
Pulse response waveform



Time 500 ps/div.

KACCB0050EB

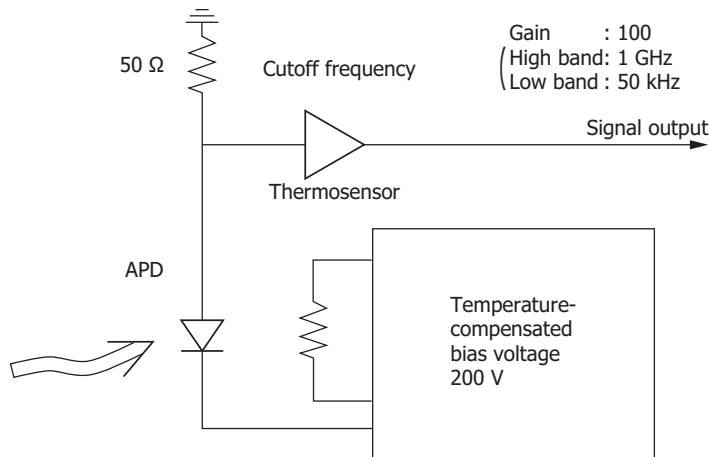
Frequency response



Frequency

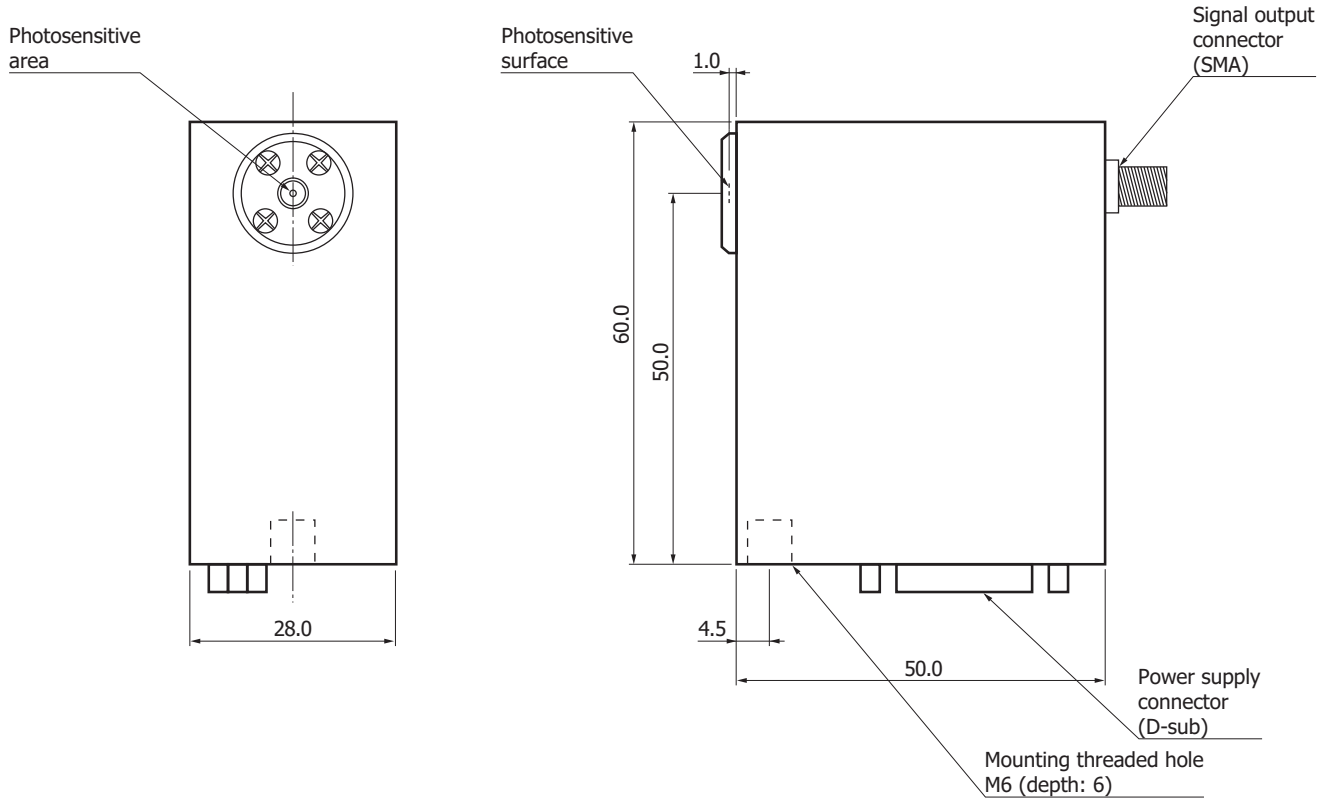
KACCB0051EC

Block diagram



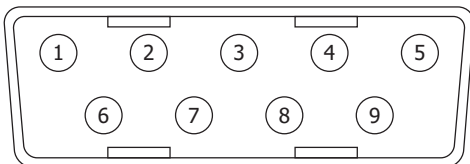
KACCC0135ED

Dimensional outline (unit: mm)



KACCA0092EC

Pin connections



KACCC0134EA

Pin no.	Signal
1	+12 V
2	NC
3	GND
4	NC
5	NC
6	NC
7	NC
8	NC
9	NC

Mating connector (supplied): DE-9S (made by JAE) or equivalent

Accessories

- CD-ROM (Instruction Manual)
- D-sub connector

Related information

www.hamamatsu.com/sp/ssd/doc_en.html

- Precautions
- Disclaimer

Information described in this material is current as of October 2018.

Product specifications are subject to change without prior notice due to improvements or other reasons. This document has been carefully prepared and the information contained is believed to be accurate. In rare cases, however, there may be inaccuracies such as text errors. Before using these products, always contact us for the delivery specification sheet to check the latest specifications.

The product warranty is valid for one year after delivery and is limited to product repair or replacement for defects discovered and reported to us within that one year period. However, even if within the warranty period we accept absolutely no liability for any loss caused by natural disasters or improper product use. Copying or reprinting the contents described in this material in whole or in part is prohibited without our prior permission.

HAMAMATSU

www.hamamatsu.com

HAMAMATSU PHOTONICS K.K., Solid State Division

1126-1 Ichino-cho, Higashi-ku, Hamamatsu City, 435-8558 Japan, Telephone: (81) 53-434-3311, Fax: (81) 53-434-5184

U.S.A.: Hamamatsu Corporation: 360 Foothill Road, Bridgewater, N.J. 08807, U.S.A., Telephone: (1) 908-231-0960, Fax: (1) 908-231-1218, E-mail: usa@hamamatsu.com

Germany: Hamamatsu Photonics Deutschland GmbH: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49) 8152-375-0, Fax: (49) 8152-265-8, E-mail: info@hamamatsu.de

France: Hamamatsu Photonics France S.A.R.L.: 19, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: 33-(1) 69 53 71 00, Fax: 33-(1) 69 53 71 10, E-mail: infos@hamamatsu.fr

United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court, 10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, United Kingdom, Telephone: (44) 1707-294888, Fax: (44) 1707-325777, E-mail: info@hamamatsu.co.uk

North Europe: Hamamatsu Photonics Norden AB: Torshamnsgatan 35 16440 Kista, Sweden, Telephone: (46)8-509 031 00, Fax: (46)8-509 031 01, E-mail: info@hamamatsu.se

Italy: Hamamatsu Photonics Italia S.r.l.: Strada della Moia, 1 int. 6, 20020 Arese (Milano), Italy, Telephone: (39)02-93 58 17 33, Fax: (39)02-93 58 17 41, E-mail: info@hamamatsu.it

China: Hamamatsu Photonics (China) Co., Ltd.: B1201, Jiaming Center, No.27 Dongsanhuan Beilu, Chaoyang District, Beijing 100020, China, Telephone: (86) 10-6586-6006, Fax: (86) 10-6586-2866, E-mail: hpc@hamamatsu.com.cn

Taiwan: Hamamatsu Photonics Taiwan Co., Ltd.: 8F-3, No. 158, Section2, Gongdao 5th Road, East District, Hsinchu, 300, Taiwan R.O.C. Telephone: (886)03-659-0080, Fax: (886)03-659-0081, E-mail: info@hamamatsu.com.tw